## CLAIMS

1. A Micro ElectroMechanical system comprising:

a first torsional hinge that includes:

a first end;

a second end; and

a first corrugated side edge.

2. The Micro ElectroMechanical system according to claim 1 wherein:

the corrugated side edge has periodic profile.

3. The Micro ElectroMechanical system according to claim 1 wherein:

the first torsional hinge includes a second corrugated edge.

4. The Micro ElectroMechanical system according to claim 1 wherein the first torsional hinge comprises:

a plurality of wide beam sections that are characterized by a length dimension; and

a plurality of narrow beam sections that alternate in position with the wide beam sections and are characterized by about the length dimension.

5. The Micro ElectroMechanical system according to claim 1 wherein:

the first torsional hinge is characterized by a minimum width, and an average width, and the average width is between about 1.5 and about 7 times the minimum width.

6. The Micro ElectroMechanical system according to claim 5 wherein:

the average width is between about 2 and about 5 times the minimum width.

7. The Micro ElectroMechanical system according to claim 6 wherein the first torsional hinge has:

a plurality of abrupt increases in width that are interspersed with a plurality of abrupt decreases in width.

8. The Micro ElectroMechanical system according to claim 1 wherein the first torsional hinge comprises:

a monocrystalline silicon material that extends, at least, from the first end to the second end.

9. The Micro ElectroMechanical system according to claim 8 wherein:

the monocrystalline silicon material includes an ion implanted dopant conductive pathway.

10. The Micro ElectroMechanical system according to claim 1 further comprising:

an anchor coupled to the first end of the first torsional hinge;

a resonant member that is dimensioned to resonate at a first frequency and is coupled to the second end of the first torsional hinge;

wherein the first torsional hinge has a phase length that is equal to about an odd multiple of $\pi/2$ in a torsional mode at the first frequency.

11. The Micro ElectroMechanical system according to claim 10 wherein:

the torsional hinge has a phase length that is equal to about $\pi/2$ in the torsional mode at the first frequency.

12. The Micro ElectroMechanical system according to claim 10 further comprising:

a conductive pathway from the anchor, along the first torsional hinge and onto the resonant member.

13. The Micro ElectroMechanical system according to claim 10 wherein:

the resonant member comprises a monocrystalline material layer; and

the elongated beam comprises the monocrystalline material layer.

14. The Micro ElectroMechanical system according to claim 13 further comprising:

an ion implant doped conductive pathway from the anchor, along the first torsional hinge and onto the resonant member.

15. The Micro ElectroMechanical system according to claim 10 wherein:

the resonant member is a beam that extends perpendicular to the first torsional hinge and is resonant in a flexural beam mode that includes a first node; and

the second end of the first torsional hinge is coupled to the beam at the first node.

16. The Micro ElectroMechanical system according to claim 15 further comprising:

a conductive pathway from the anchor, along the first torsional hinge, and onto the beam.

17. The Micro ElectroMechanical system according to claim 16 wherein:

the beam comprises a monocrystalline material layer;

the first torsional hinge comprises the monocrystalline material layer.

18. The Micro ElectroMechanical system according to claim 17 wherein:

the monocrystalline material layer includes a first semiconductor.

19. The Micro ElectroMechanical system according to claim 17 wherein:
the anchor comprises:
the monocrystalline material layer;
a second material layer underlying the monocrystalline material layer; and
a base layer underlying the second material layer.

20. The Micro ElectroMechanical system according to claim 19 wherein:
the second material layer includes an oxide; and
the base layer comprises a semiconductor.

21. The Micro ElectroMechanical system according to claim 20 wherein:
the monocrystalline material layer comprises silicon;
the second material layer comprises silicon dioxide; and
the base layer comprises silicon.

22. The Micro ElectroMechanical system according to claim 20 wherein:
the monocrystalline material layer comprises a III-V semiconductor;
the second material layer comprises a perovskite; and
the base layer comprises a group IV semiconductor.

23. The Micro ElectroMechanical system according to claim 15 wherein:

the beam includes:

a first longitudinal edge; and

a second longitudinal edge; and

the Micro ElectroMechanical system further comprises:

a second torsional hinge that has

a first end;

a second end; and

a corrugated side edge;

the second end of the first torsional hinge is coupled to the first longitudinal edge of the beam;

the second end of the second torsional hinge is coupled to the second longitudinal edge of the beam at the first node; and

the second torsional hinge has a phase length that is equal to about an odd multiple of $\pi/2$ in a torsional mode at about the first frequency.

24. The Micro ElectroMechanical system according to claim 23 wherein the flexural beam mode includes a second node; and

the Micro ElectroMechanical system further comprises:

a third torsional hinge that includes:

a first end;

a second end; and

a corrugated side edge;

a fourth torsional hinge that includes:

a first end;

a second end; and

a corrugated side edge;

the second end of the third torsional hinge is coupled first longitudinal edge of the beam at the second node;

the second end of the fourth torsional hinge is coupled to the second longitudinal edge of the beam at the second node;

the third torsional hinge has a phase length that is equal to about an odd multiple of $\pi/2$ in a torsional mode at the first frequency; and

the fourth torsional hinge has a phase length that is equal to about an odd multiple of $\pi/2$ in a torsional mode at the first frequency.

25. The Micro ElectroMechanical system according to claim 24 wherein the first torsional hinge, the second torsional hinge, the third torsional hinge, and the fourth torsional hinge have phase lengths that are about equal to $\pi/2$ at the first frequency.

26. A Micro ElectroMechanical system comprising:

a torsional hinge including

a first torsional hinge that includes:

a first end;

a second end; and

is characterized by:

a length dimension measured between the first end and the second end; and

a width that is measured perpendicular to the length dimension and varies as a function of position along the length.

27. The Micro ElectroMechanical system according to claim 26 wherein:

the torsional hinge comprises:

a first tapered section that is located at the first end and in which the width increases continuously as a distance from the first end increases.

28. The Micro ElectroMechanical system according to claim 27 wherein:

the torsional hinge comprises:

a second tapered section that is located at the second end and in which the width increases continuously as a distance from the second end increases.

29. The Micro ElectroMechanical system according to claim 26 wherein:

the torsional hinge comprises:

a first narrow width section at the first end.

30. The Micro ElectroMechanical system according to claim 29 wherein:

the torsional hinge further comprises:

a second narrow width portion at the second end.

31. The Micro ElectroMechanical system according to claim 26 wherein:

a first width measured at the first end has a first value; and

widths measured at all positions between the first end and the second end are equal to at least about the first value.

32. The Micro ElectroMechanical system according to claim 26 wherein:

a second width measured at the second end has a second value; and

the width measured at all positions between the first end and the second end is at least about equal to the second value.

33. The Micro ElectroMechanical system according to claim 32 further comprising:

a anchor coupled to the first end of the torsional hinge; and

a flexural mode resonant beam coupled to the second end of the torsional hinge.

34. A Micro ElectroMechanical system comprising:

a torsional hinge that includes:

a first end;

a second end; and

a plurality of holes through the torsional hinge.

35. The Micro ElectroMechanical system according to claim 34 further comprising:

an anchor coupled to the first end of the first torsional hinge;

a resonant member that is dimensioned to resonate at a first frequency and is coupled to the second end of the first torsional hinge;

wherein the first torsional hinge has a phase length that is equal to about an odd multiple of $\pi/2$ in a torsional mode at the first frequency.

36. The Micro ElectroMechanical system according to claim 35 wherein:

the resonant member is a beam that extends perpendicular to the first torsional hinge and is resonant in a flexural beam mode that includes a first node; and

the second end of the first torsional hinge is coupled to the beam at the first node.